**Patent Claims**

1. An air-conditioning system for a motor vehicle, having a refrigerant circuit (1) with a plurality of heat exchangers through which a refrigerant can be passed, of which one heat exchanger (12) is simultaneously part of a coolant circuit, characterized in that refrigerant recirculation from parts of the refrigerant circuit (1) which are inoperative in heating mode into a part of the refrigerant circuit (1) which is active in heating mode is provided on demand.

2. The air-conditioning system as claimed in claim 1, characterized in that the heat exchanger (12) can be disconnected from the inflow of the coolant circuit for the refrigerant recirculation mode.

3. The air-conditioning system as claimed in claim 1 or 2, characterized in that the coolant circuit is an engine coolant circuit (51).

4. The air-conditioning system as claimed in one of the preceding claims, characterized in that there are means for determining a demand for refrigerant.

5. The air-conditioning system as claimed in one of the preceding claims, characterized by means for determining whether there is sufficient refrigerant in that part of the refrigerant circuit (1) through which refrigerant flows in heating mode.

6. The air-conditioning system as claimed in claim 4 or 5, characterized in that one or more temperature sensors and/or pressure sensors are provided as means for determining a demand for refrigerant.

7. The air-conditioning system as claimed in claim 6, characterized in that the temperature sensor in the

refrigerant circuit is provided downstream of the compressor (2) and upstream of a heater (11), as seen in the direction of flow of the refrigerant.

8. The air-conditioning system as claimed in claim 6, characterized in that the pressure sensor in the refrigerant circuit is arranged upstream of the compressor (2), as seen in the direction of flow of the refrigerant.

9. The air-conditioning system as claimed in one of the preceding claims, characterized in that a nonreturn valve (RV) is provided in the refrigerant circuit (1), which nonreturn valve, in heating mode, separates active parts of the refrigerant circuit (1) from parts of the refrigerant circuit (1) which are inoperative in heating mode and, in the refrigerant recirculation mode, allows refrigerant to pass from those parts of the refrigerant circuit (1) which are inoperative in heating mode to those parts of the refrigerant circuit (1) which are active in heating mode.

10. A method for operating the air-conditioning system as claimed in one of claims 1 to 9, in which, at least in heating mode, the demand for refrigerant in a part of the refrigerant circuit (1) which is active in the heating mode is determined, and accordingly refrigerant is withdrawn from another part, which is inoperative in the heating mode, of the refrigerant circuit (1) and fed to that part of the refrigerant circuit (1) which is active in the heating mode.

11. The method as claimed in claim 10, characterized in that at least one parameter or any desired combination of parameters is monitored to determine a demand for refrigerant, the parameters which are monitored comprising the hot-gas temperature and/or the suction pressure and/or the temperature of the

refrigerant, in particular at the outlet of the evaporator, and/or the high pressure and/or the compressor rotational speed.

12. The method as claimed in claim 11, characterized in that it is possible to predetermine threshold values for the monitoring of said parameters, the monitoring then detecting values which exceed or fall below the predeterminable threshold values.

13. The method as claimed in claim 12, characterized in that the threshold values can be derived from characteristic diagrams which are determined from the parameters and/or combinations of parameters.

14. The method as claimed in one of claims 10 to 13, characterized in that the refrigerant recirculation is terminated after a predetermined time or after the heating power has dropped below a predetermined, minimum heating power or after a hot-gas temperature has dropped below a hot-gas temperature threshold value or after a suction pressure has dropped below a suction pressure threshold value.

15. The method as claimed in one of claims 10 to 14, characterized in that an expansion valve (XV1) in a part of the refrigerant circuit (1) which is active in the heating mode is closed and the air routing in the air-conditioning equipment is switched to recirculated air.

16. The method as claimed in claim 15, characterized in that the expansion valve (XV1) is opened again after the suction pressure has dropped below a predeterminable suction pressure level.

17. The method as claimed in one of claims 10 to 16, characterized in that a fan is switched on in order to

apply air to a gas cooler (3).

18. The method as claimed in one of claims 10 to 17, characterized in that when the heat exchanger (12) is operated in a heating mode, this heat exchanger (12) is disconnected from the coolant circuit when the suction pressure exceeds an upper limit value.

19. The method as claimed in claim 18, characterized in that the heat exchanger (12) is connected back into the coolant circuit after the suction pressure has dropped below a second limit value.

20. The method as claimed in one of claims 10 to 19, characterized in that a constant suction pressure can be set by means of the flow of coolant in the evaporator.